opportunity for random chance deviation becomes very small, such that the "safe harbor" should be adjusted accordingly or eliminated.

The Commission should not establish the applicable statistical test at this time, but should adopt the principles described herein as a guideline for statistical analysis. The rationale for balancing risk through statistical analysis is presented in the attached white paper, Measuring Performance Parity - Equal Risk, Fair Rights.

V. CONCLUSION

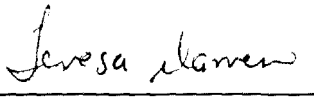
TCG generally supports the Commission's proposed performance measurements and reporting requirements, which incorporate many of the measurements and categories needed to ascertain whether ILECs are providing CLECs interconnection in parity with what the ILEC offers to itself. TCG proposes discrete modifications to ensure that CLECs do not bear the burden of showing discrepancies when the reporting requirements do not provide sufficient information about the ILECs self-provisioning, particularly related to UNEs (or their equivalent). Specifically, TCG advocates adding measurement categories necessary to ascertain whether CLEC unbundled network element service orders are on par with comparable ILEC functions and disaggregating "retail specials" categories by narrowband, wideband, and broadband. TCG also proposes eliminating or simplifying specific measurements when the proposed measurement would not provide beneficial data, thus minimizing the ILEC reporting burdens. Once these

revisions are incorporated into the proposal, the proposed measurements and reporting requirements are ones that should be uniformly adopted, which will reduce carrier costs of reaching similar appropriate plans in numerous jurisdictions by eliminating the need for state-by-state entanglements.

For these reasons, TCG respectfully requests that the Commission adopt the performance measurements and reporting requirements with the incorporation of revisions submitted by TCG herein.

Respectfully submitted,

TELEPORT COMMUNICATIONS GROUP INC.



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Dated: June 1, 1998

CERTIFICATE OF SERVICE

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Measuring Performance Parity: *Equal Risk, Fair Results*

March 1998

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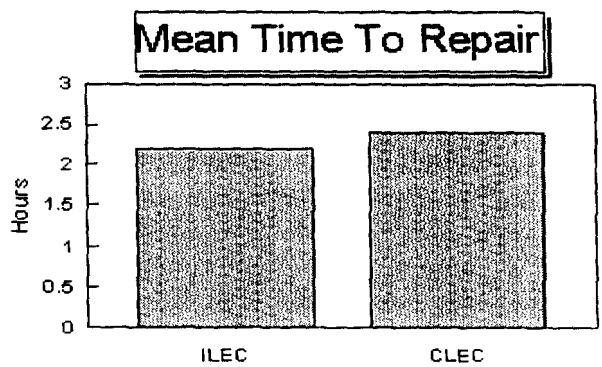
Introduction

Under the 1996 Telecommunications Act, each competitive local exchange carrier ("CLEC") is entitled to interconnection with each incumbent local exchange carrier ("ILEC") that is at least equal to what the ILEC provides for itself. TCG refers to this legal standard as the "Performance Parity Principle." In two earlier White Papers, TCG discussed two critical aspects of the Performance Parity Principle. In *The Performance Parity Principle*, TCG detailed the statutory obligations of the ILECs to provide interconnection and unbundled elements to CLECs that is at least equal to that which the ILECs provide to themselves. In *Model Performance Parity Measures for Facilities-Based Competition*, TCG identified the 38 ILEC interconnection and unbundling functions for which the ILEC must demonstrate its compliance with the "at least equal" standard. In this paper, TCG proposes a fair and efficient approach to analyzing ILEC performance data - an approach that minimizes the enforcement burdens on public utility commissions, CLECs, and ILECs.

"Stare and Compare"

To enforce performance parity, it is necessary to compare the performance of the ILEC for itself, its performance for each interconnecting CLEC, and its performance for other entities. Under the act, the ILEC cannot discriminate nor treat itself or its customers any better than it treats an interconnecting local competitor. **Any deviation from performance parity is illegal and subjects the ILEC to civil penalties.**



The question is: How should the ILEC demonstrate easily and efficiently that it has met the Performance Parity Principle? A simple "stare-and-compare" test of the ILEC's performance for itself and for each CLEC would seem to indicate whether or not the ILEC is complying with the law. For

example, if the ILEC's mean time to repair ("MTTR") for itself was 2 hours 15 minutes, and for a CLEC it was 2 hours 20 minutes, then the CLEC could legitimately claim that its treatment was not "at least equal" and that the ILEC was violating the law. One might challenge this simple comparison, however, as not *statistically* sound. That is, the difference of five minutes in performance might be no more than a random occurrence. Consider 100 tosses of a coin, for example. If the coin landed "heads" 54 times and "tails" 46 times, one would not conclude that the coin was biased in favor of "heads." The deviation from the 50-50 split is within the range or results that might occur by chance. Similarly, if in measuring Performance Parity the ILEC's performance for its own customers was only "marginally" better than its performance for the CLEC's customers, the ILEC could reasonably argue that the variation was simply a chance occurrence and not statistically significant.

A strict interpretation of the Telecommunications Act leaves no doubt that, chance or not, the ILEC is obligated to provide "at least equal" service, even if that means taking extra steps to eliminate or to minimize the possibility of chance occurrences. However, TCG recognizes that under certain circumstances, a certain degree of variability is difficult to control and that it may not necessarily be harmful. Furthermore, consistent strict interpretation of the "at least equal" standard could induce the CLECs and ILECs to litigate issues that have minor practical impact on their businesses. This would certainly impose costs on the CLECs and divert resources from investment in competitive infrastructure. State public utility commissions would also incur unnecessary costs adjudicating such disputes. To avoid unnecessary costs and policing, TCG proposes a simple statistical approach that captures the simplicity of "stare-and-compare" while allowing for flexible, reasonable, and statistically valid compliance with the "at least equal" standard.

Statistical "Helpers"

Before describing our approach, we must digress briefly into a discussion of statistics. Statistics help analysts draw a picture of reality based on partial information. In statistics, one rarely observes the entire universe of events that one is trying to evaluate. In the case of evaluating a coin for fairness, one records only a finite number of flips, whether it is 10 flips or a billion flips, or any number of flips in between. No matter how many times one flips the coin it is still a finite number, far less than the infinite flips that are possible. That finite number is called a *sample* and the infinity of flips is called the *population*. Because we seldom observe the entire population, statistics allow analysts to draw a reasonable conclusion about the entire population based on a sample from that population.

There is a catch, however: coming to a conclusion about the population based on a sample is an inherently risky exercise. The sample may not represent the underlying population, perhaps leading the statistician to an incorrect conclusion. To minimize the risk of committing such an error, the statistician "hedges" by allowing for a certain amount of variability in the sample data before coming to a conclusion. The extent of that permitted variation will depend on the

risks of coming to the wrong conclusion and it is the key to ensuring fair and proper enforcement of the Performance Parity Principle.

A statistician risks making two types of errors that are inherent in statistical analysis, and each is best explained in terms of the coin flip. First, there is the risk that the statistician might conclude that a coin was biased when, in fact, it was fair. Second, there is the risk that the statistician might conclude that the coin was fair when, in fact, it was biased. The challenge facing the statistician is how to balance the risks of these two types of errors. If the statistician is concerned with the first type of error, he or she will not conclude that the coin is biased unless the deviation from the 50-50 split is relatively large. On the other hand, if the statistician is more concerned with the second type of error, he or she will conclude that the coin is biased if the deviation from the 50-50 split is relatively small. The rest of this paper explores the means for determining the size of that deviation in a manner that **balances the interests of both CLECs and ILECs.**

Applying "Equal Risk" to Interconnection

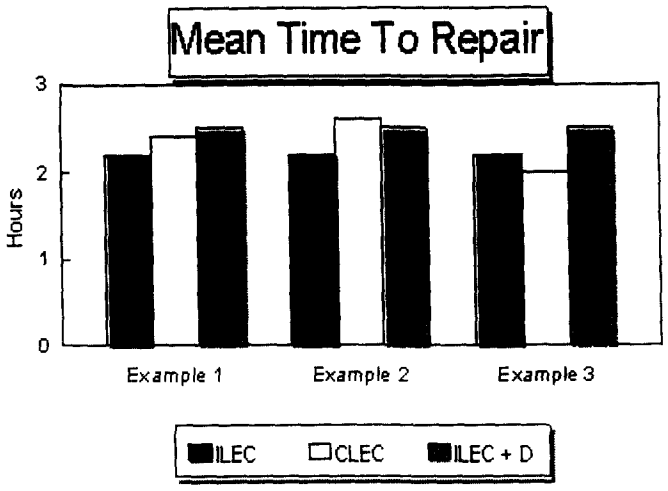
In terms of interconnection, the sample data would be the number times the ILEC performed an operation for itself and for the CLEC during a specific time period (e.g., one month, one calendar quarter), while the population would be every possible instance of the operation that the ILEC might perform for itself and the CLEC for as long as the networks might be interconnected. Because we will never be able to observe the population of ILEC performance, the state commission or other enforcement body must rely upon statistical analysis to determine ILEC compliance with the law.

In doing so, the commission might make one of the two possible errors discussed above. First, based on the sample observations, the commission could conclude that the ILEC is not adhering to the Performance Parity Principle when, in fact, it is. The ILEC, of course, would like to minimize that possibility. Conversely, the commission could conclude that the ILEC is meeting the "at least equal" standard when, in fact, it is not. CLECs would like to minimize that possibility.

As noted earlier, each type of error has a certain amount of risk associated with it. In the interest of fairness, therefore, TCG proposes that the deviation from the simple "stare-and-compare" be based on equalizing the risks associated with each type of error. That way, each carrier bears the same statistical risk of an erroneous conclusion counter to its own interest.

This approach is only marginally more complex than a simple "stare-and-compare" analysis: in the simple "stare-and-compare" case, the commission would reject any performance that was not "at least equal" now it simply rejects any performance that is not equal by a specific amount, "D."

Consider the following examples:



In general, so long as the top of the bar representing the performance provided to a CLEC is lower than the top of the "ILEC + D" bar, the CLEC is likely to be receiving "at least equal" treatment and the ILEC should be considered in compliance with the statute. If the bar representing the performance provided to a CLEC is above the "ILEC + D" bar, then the CLEC is not receiving "at least equal" treatment and the ILEC is violating the statute. In Example 1, the simple "stare-and-compare"conclusion would be that the ILEC is violating the Performance Parity Principle because the CLEC's MTTR exceeds the ILEC's. However, the difference in performance cannot be considered significant because it is less than the statistically valid value of D, as represented by the last bar in each cluster. Example 2 shows a clear cut case of the ILEC in violation of the standard, and Example 3 shows a clear cut case of the ILEC in compliance. Similar charts could be drawn for each of the 38 ILEC activities identified by TCG in *Model Performance Parity Measures for Facilities-Based Competition.*

The debate between the CLECs and the ILECs will focus on the value of "D." The ILEC might argue that in "traditional" scientific inquiry, statisticians would be most concerned with falsely concluding that the ILEC is violating the law. Therefore, following such "tradition," the risk associated with such a false conclusion is minimized and the risk associated with falsely concluding that they are in compliance is generally ignored. For example, one is usually reluctant to conclude that a coin is biased and, as noted earlier, one would not conclude that a coin was biased based on results of 54 heads and 46 tails. Indeed, using "traditional" parameters, one would not conclude the coin was biased in favor of heads unless it turned up heads at least 60 times out of 100 tosses.

Assuring parity with respect to Interconnection cannot be viewed as a subject to such "traditional" parameters, however. The stakes are too high. The potential harm to the public's interest in a competitive market of concluding that the ILEC is complying with the performance parity principle when it is not, is as great or greater than any harm that could result from concluding that the ILEC is not complying when it is. **The risk of a monopoly perpetuating its market power by providing inferior interconnection threatens the public more than the risk of a competitor erroneously claiming that performance parity does not exist.** In terms of the coin toss analogy, even though we would not want to reject a fair coin

incorrectly, we most certainly would not want to accept a biased coin incorrectly.

TCG's proposal guards against both risks and recognizes the legitimate claims of both ILECs and CLECs. The ILEC does not want to be found in violation of the standard inaccurately and therefore would propose a large "D". TCG does not want the ILEC to get away with poor performance, and is justified by the Telecommunications Act in arguing that "D" should, in fact, equal zero. It makes eminent sense, therefore, to establish "D" such that **each party bears the same risk of an error against its interests.**

So, What is "D"?

The value of "D" depends on five factors: the number of times the ILEC performs the measured operation for itself and for the CLEC, the variability of the ILEC's performance for itself and for the CLEC, and the CLEC's definition of acceptable ILEC behavior. Of the five, only the last is within the explicit control of one of the parties, i.e., the CLEC. Under the statute the CLEC is entitled to performance that is "at least equal," with no exceptions or qualifications. The extent to which the CLEC is willing to accept something other than "at least equal" is completely up to the CLEC. **In the event that the ILEC objects to the CLEC's position and the issue is sent to arbitration, the arbitrator must select the CLEC's position to comply with the Act.**

The formulas that calculate "D" may appear rather complex (like many statistical formulas), but in fact the calculations are easy to perform in a computer spreadsheet. In general, all else held constant, "D" tends to decline as the number of observations increase, tends to increase as the variability of the ILEC's performance increases, and tends to decline as the CLEC-specified acceptable limit of ILEC performance for the CLEC approaches the ILEC's performance for itself.

Apples to Apples

The danger in any statistical analysis is that it might hide more than it reveals, and that danger certainly exists here. For example, a comparison of averages (such as the mean time to repair) could potentially mask great disparities within the data. The ILEC may be very quick to repair the unbundled loops of the CLEC's many low-volume (and low-revenue) customers, but very slow to repair the unbundled loops of the CLEC's high-volume (and high-revenue) customers. By treating the CLEC's largest customers poorly, the ILEC would hope to convince those customers that they should switch to the ILEC for service. If the ILEC's performance were simply measured by the two sample means, such anticompetitive behavior might go undetected.

The best way to discourage and to detect such anticompetitive behavior is to segment the data so that "apples-to-apples" comparisons can be made. That is, the ILEC's performance towards the CLEC's customers should be compared to the ILEC's performance towards its

own similarly situated customers. Customer size and location are two of the obvious criteria for segmenting the data, but there may be others. In any event, steps must be taken to ensure proper analysis of all the data, including a calculation of "D" for each set of data.

Adding Depth and Perspective

As important as it is to evaluate the ILEC's performance each month, it would be a mistake to rely solely upon this "snapshot" of data as the definitive picture of the state of interconnection. To obtain a more complete picture, the ILEC's performance must be examined in its entirety and over time. Otherwise, the ILEC might take advantage of the leeway afforded by "D" by always providing inferior service to the CLEC but without violating the "Equal Risk" standard. To prevent the ILEC from turning the "Equal Risk" parameters for each measure or for each month into a license to hobble the CLEC systematically, the domain of the "Equal Risk" approach must expand to encompass two additional dimensions.

First, the ILEC's performance should be examined *in toto* each month, not just measure by measure. Suppose, for example, that the ILEC's performance during a particular month was better for itself than for the CLEC on 34 of the 38 measures, but never exceeded the "ILEC + D" bound (that is, 34 of the measures were similar to the bar chart in Example 1, above). Taken separately and in isolation, each measure would not lead to a conclusion that the ILEC was violating the law. But taken together, such evidence paints a rather clear picture of systematic ILEC malfeasance.

Second, the ILEC's behavior should be tracked over time to detect any systematic attempts to mistreat CLECs. For example, suppose that over a period of ten months, the ILEC's performance each month on a particular measure was never "at least equal" but also never exceeded the "ILEC + D" boundary (i.e., as in Example 1). Again, each month's data examined individually would not reveal any ILEC transgression. Taken together, however, the monthly data indicate systematic violation of the Performance Parity Principle.

Swift Enforcement

The "Equal Risk" approach is useless unless the ultimate enforcement mechanism imposes significant penalties on the ILEC for failing to meet even its relatively liberal standards. "Equal Risk" represents a concession by the CLEC that the ILEC's poor performance might occasionally result from chance or statistical "noise." Regulators must not hesitate, therefore, to impose appropriately severe penalties on the ILECs for *any* violation of the "Equal Risk" standards. Failure to impose swift justice will only encourage the ILECs to turn an equitable inch into a monopolistic mile.

Conclusion

ILEC compliance with the Performance Parity Principle is critical to the successful development of competition at all levels of the telecommunications industry. TCG's "Equal Risk" approach provides

regulators, ILECs, and CLECs with an efficient, fair, and valid way to measure ILEC performance. "Equal Risk" minimizes the cost to all parties, including regulators, by establishing reasonable enforcement standards that still discourage ILEC abuses. "Equal Risk" balances the interests of both the CLEC and ILEC so that each bears the same risk of being wrongly judged on the basis of statistics provided by the ILEC. And, "Equal Risk" is based on accepted statistical practices.

ILECs that are genuinely interested in facilitating local competition will embrace both the Performance Parity Principle and the reasonable statistical methods for measuring parity outlined in this paper. They have nothing to fear from close scrutiny of their performance and will earn the rewards inherent in ongoing and consistent compliance with the Performance Parity Principle. ILECs that are intent upon preserving their monopoly position will oppose or seek to frustrate TCG's reasonable proposal as they have opposed all reasonable attempts to bring the benefits of competition to consumers of local telecommunications services. Such opposition reveals their true intentions and amply demonstrates the need for vigilance and severe penalties for failing to comply with the Performance Parity Principle. In both cases, "Equal Risk" will help ensure that justice is served in the pursuit of Performance Parity.

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